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CLAIM SCHEDULE

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CLAIMS

46 1. (As Amended) A method of making a gel which is not water soluble comprised of making a
47 water soluble polymer of an acrylic acid compound comprising:

48 combining an acrylic acid compound with a reactant selected from the group consisting
49 of a divalent metal salt of said acrylic acid compound, a monovalent metal salt of said acrylic
50 acid compound and mixtures thereof to form a polymer precursor,

51 combining a polymerization initiator with said precursor ,

52 permitting said precursor to form said water soluble polymer, and

53 combining said water soluble polymer with a cross linking agent to form said gel;

54 wherein

55 said polymer precursor contains in the range of from about 0.65 to about 2.75 units of
56 said divalent metal salt of said acrylic acid compound per unit of said acrylic acid compound
57 and in the range of from about 0 to about 2.25 units of said monovalent metal salt of said acrylic
58 acid compound per unit of said acrylic acid compound, and

59 said acrylic acid compound is represented by the formula $\text{CH}_2=\text{CR}-\text{COOH}$ and R is
60 hydrogen or a methyl group

61 and further wherein

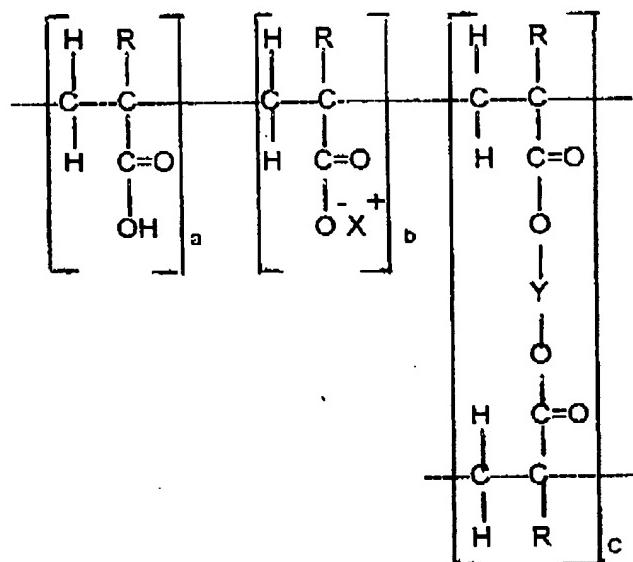
62 said gel is stable at temperatures up to about 450 degrees Fahrenheit.

63 2. (Original) The method of claim 1 wherein said polymerization initiator is a free radical
64 initiator.

65 3.(Canceled) The method of claim 2 wherein said water soluble polymer is combined with a
66 cross linking agent to form a gel which is not water soluble and is stable at temperatures up to
67 about 450 degrees Fahrenheit.

- 68 4. (As Amended) The method of claim 2 wherein said cross linking agent is a compound
69 containing a trivalent metal.
- 70 5. (As Amended) The method of claim 2 wherein said cross linking agent is a compound
71 containing chromium having a valence of + 3.
- 72 6. (Original) The method of claim 2 wherein said acrylic acid compound is acrylic acid, said
73 divalent metal salt is magnesium acrylate and said monovalent metal salt is an alkali metal
74 acrylate.
- 75 7. (Original) The method of claim 5 wherein said divalent metal salt is the reaction product of
76 acrylic acid and a magnesium compound selected from magnesium oxide, magnesium
77 hydroxide and magnesium carbonate and said monovalent metal salt is the reaction product of
78 acrylic acid and a sodium compound selected from sodium oxide, sodium hydroxide and
79 sodium carbonate.
- 80 8. (Original) The method of claim 7 wherein said cross linking agent is chromium acetate, said
81 sodium compound is sodium hydroxide and said magnesium compound is magnesium
82 hydroxide.
- 83 9. (Withdrawn From Consideration) The product of the method of claim 6.
- 84 10.(Withdrawn From Consideration) The product of the method of claim 8.

85 11.(Withdrawn From Consideration) A composition of matter represented by the formula



95 wherein

96 R is independently H and -CH₃; X is Na, K, Li, Rb, Cs, or NH₃; Y is Be, Mg, Ca, Sr, B or
97 Zn; a is 1, b has a value in the range of from 0 to about 2.25 and c has a value in the range of
98 from about 0.65 to about 2.75.

99 12. (As Amended) A method of making a gel which is not water soluble comprised of making a
100 water soluble polymer comprising:

101 forming a polymer precursor by mixing an acrylic acid compound with a material
102 selected from the group consisting of a divalent metal compound, a monovalent metal
103 compound and mixtures thereof,

104 combining a polymerization initiator with said precursor,

105 permitting said precursor to form said water soluble polymer and

106 combining said water soluble polymer with a cross linking agent to form said gel;

107 wherein

108 the ratio of said monovalent metal compound to said acrylic acid compound in said

109 precursor is an amount in the range of from about 0 to about 0.5 moles of said monovalent
110 metal compound per mole of said acrylic acid compound and the ratio of said divalent metal
111 compound to said acrylic acid compound in said precursor is an amount in the range of from
112 about 0.15 to about 0.5 moles of said divalent metal compound per mole of said acrylic acid
113 compound;

114 said acrylic acid compound is represented by the formula $\text{CH}_2=\text{CR}-\text{COOH}$ wherein R is
115 hydrogen or a methyl group;

116 said monovalent metal compound is represented by the general formula X_NM and said
117 divalent metal compound is represented by the general formula YM_Z wherein Y is beryllium,
118 magnesium calcium, strontium, barium or zinc; X is sodium, potassium, lithium, rubidium,
119 cesium or an ammonia group; M is oxygen, a hydroxide group or a carbonate group; z is 1 or 2,
120 and N is 1 or 2; and

121 said gel is stable at temperatures up to about 450 degrees Fahrenheit.

122 13. (Original) The method of claim 12 wherein R is hydrogen, X is sodium, Y is magnesium, M
123 is a hydroxide group, z is 2, and N is 1.

124 14. (Original) A method of adjusting the permeability of a subsurface formation to regulate the
125 flow of water in said formation, said method being comprised of the steps of introducing into
126 said subsurface formation a gel which is not water soluble and is stable at temperatures up to
127 about 450 degrees Fahrenheit, wherein said gel is made by the steps of

128 combining an aqueous solution of acrylic acid with a reactant selected from the group
129 consisting of an alkaline earth metal salt of acrylic acid, an alkali metal salt of acrylic acid and
130 mixtures thereof to form a polymer precursor,

131 combining a polymerization initiator with said precursor and permitting said precursor to
132 form a water soluble polymer and thereafter,

133 combining said water soluble polymer with a cross linking agent to form said gel;

134 wherein

135 said acrylic acid, said alkaline earth metal salt and said alkali metal salt are combined in

136 a ratio in the range of from about 0.65 to about 2.75 units of said alkaline earth metal salt per

137 unit of said acrylic acid and in the range of from about 0 to about 2.25 units of said alkali metal

138 salt per unit of said acrylic acid.

139 15. (Original) The method of claim 14 wherein said alkaline earth metal salt is magnesium

140 acrylate and said alkali metal salt is sodium acrylate.

141 16. (Original) A method of adjusting the permeability of a subsurface formation to regulate the

142 flow of water in said formation, said method being comprised of the steps of introducing into

143 said subsurface formation a gel which is not water soluble and is stable at temperatures up to

144 about 450 degrees Fahrenheit, wherein said gel is made by the steps of

145 forming a polymer precursor by mixing acrylic acid with a material selected from the

146 group consisting of magnesium hydroxide, sodium hydroxide and mixtures thereof,

147 combining a polymerization initiator with said precursor and permitting said precursor to

148 form a water soluble polymer and thereafter,

149 combining said water soluble polymer with a cross linking agent to form said gel;

150 wherein

151 the ratio of said sodium hydroxide to said acrylic acid in said precursor is an amount in

152 the range of from about 0 to about 0.5 moles of said sodium hydroxide per mole of said acrylic

153 acid and the ratio of said magnesium hydroxide to said acrylic acid in said precursor is an

154 amount in the range of from about 0.15 to about 0.5 moles of said magnesium hydroxide per

155 mole of said acrylic acid.